Barker and Dr. Margaret Fishenden on the efficiency of various forms of grates and kitchen-ranges (already reviewed in these columns), and partly on statistics collected by the Manchester Air Pollution Advisory Board (of which Mr. Simon is chairman) on the cost of washing, a sum estimated at 250,000*l.* a year. The subject is introduced in a preface by Lord Newton, who acted as chairman of the Departmental Committee, and has given time and thought and a sustained and disinterested enthusiasm not often associated in the minds of most people with members of the Upper House. He has even travelled abroad with the sole object of learning how smoke was successfully controlled or prevented in foreign cities.

It is hoped that Lord Newton's pungent remarks on governments—parliamentary and municipal—may be read in the right quarter. He says: "The battle . . . against industrial smoke may be said to have been won in principle, but it is scarcely necessary to warn enthusiasts that there are many parliamentary dangers to be overcome, and that governments are not as a rule particularly zealous in forcing through bills of a non-vote-catching nature."

If the object of the authors was to make out a case against domestic smoke by demonstrating in clear and incisive language, backed by carefully ascertained statistics, its wastefulness and uselessness and the damage it entails, which may be reckoned in millions of pounds annually, the little volume before us may be said to have more than accomplished its purpose. It is now for the public to read the case presented by the authors, take it to heart, and put the conclusions to practical use. The authors have not restricted their remarks to destructive criticism of present methods and appliances for heating and cooking. They have shown a better way. Though they condemn, as all witnesses condemned, the old-fashioned open range, they have described and illustrated modern ranges and discussed their efficiency for varied requirements. They explain in simple language the comparative value of coal, coke, and semi-coke (low-temperature coke) and the relative cost of gas and coal. The book does not profess to be a scientific treatise, and a good deal of recent research on the use of gas for cooking and on the subject of ventilation has been overlooked; but this is no drawback. It is intended for householders, builders, and architects, to whom an appeal based on scientific principles would be incomprehensible and almost certainly unread.

As the new bill excludes all domestic fireplaces and largely ignores the recommendations of the Departmental Committee in regard to new housing construction, it is well that the authors of "The Smokeless City" have saved from the eternal silence of Ministerial pigeon-holes the accumulated and valuable evidence of so many expert witnesses.

Leaving then the subject of domestic smoke, we may consider for a moment the improvements and defects in the new bill. The amendments are few; the qualification of the indefinite term "black" is omitted, and the expression "smoke" includes soot, ash, and grit; the maximum penalty is raised from 5*l.* to 50*l.*, and the person summoned under the Act must show in his defence that he has used "the best practicable means." On the other hand, there is no reference to the supervision of heating arrangements in new private dwellings but only in public buildings; there is no attempt to standardise the system of inspection of factory chimneys, strongly advocated by the representative of the Sanitary Inspectors' Association; no clear definition of the powers of the central authority; no combination of large areas under the County or Borough Councils; no inclusion of new processes emitting noxious vapours; no provision for competent scientific advisors and supervisors appointed by the Ministry of Health to control and report—in short, the position remains very much *in statu quo*, and the prevention of smoke in industrial areas still remains in the incompetent hands of the local authority, without pressure from the central authority.

The only hope for salvation lies in the energetic action of a disinterested sanitary committee and its medical officer. As the two are linked together, and the smoke inspector harnessed to them, and as members of the sanitary committee are usually interested in manufacture and factory chimneys, the prospect of amelioration is not bright. But if such a disinterested sanitary committee, intent on the purification of its atmosphere, existed, it would reduce boiler smoke to a negligible amount (and the greater part of the factory smoke comes from boilers); it would have a building to exhibit the best appliances for domestic heating and cooking; afford details of the cost of installation and efficiency; it would promote classes for stokers, and appoint an expert, scientifically trained, and well-paid inspector. Such an ideal committee would within a short period render the atmosphere comparable with that of the clean industrial centres of France or Germany.

J. B. Cohen.

The Earth's Structure and its Evolution.

Earth Evolution and its Facial Expression. By Prof. W. H. Hobbs. Pp. xviii + 178. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1922.) 15*s.* net.

THIS volume is intended to present to the non-technical reader the author's conclusions on the form and structure of the earth's crust. The contents may be summarised as follows. The first chapter deals with some theories of world formation, Laplace's nebular hypothesis being a special object of attack. The second chapter discusses the nature of the earth's interior, after which four chapters relate to the facts and problems connected with volcanic lava. A broader viewpoint is returned to in chapter 7, which treats of the changes of figure through which the earth has passed; this subject is further developed in the following five chapters, the titles of which refer to the present regions of rapid change, the contrasted aspects of the earth's face, the migrational movements of the earth's surface, the patterns of the "facial wrinkles," and the design of the fracture marquetry. The bearing of the composition of lavas on the question of earth physiognomy is then dealt with, and the final (fourteenth) chapter again reviews the theories of the earth. The author gives a list of references at the end of each chapter to works and papers on the subject of the chapter, but no general index of names or subjects is provided, an omission which should be supplied if a second edition is called for.

Despite the somewhat terrifying vocabulary of the geologist, the book contrives to be interesting, and one of its most commendable features is its wealth of illustration, by diagrams, maps, and photographs. The discussion is of a less broad and comprehensive character than the title would lead one to expect, the balance of the book being rather upset by the prominence given to the vulcanological topics in which the author is specially interested. In themselves, however, these chapters contain some of the most novel and interesting parts of the book.

A more serious criticism than that of the title is that the author makes no mention of much important recent work bearing on his subject, as, for example, when dealing with general theories of earth formation, where one is surprised to find nothing about Jeans's cosmogonic researches. The author is particularly concerned to overthrow the notion, based on observations of volcanic lava, that the earth's interior is molten, only the crust being solid. This view has been generally abandoned by geophysicists, on the ground of seismological and other evidence which the author describes. It has, however, long been historically connected with Laplace's nebular hypothesis, though the latter is of much later date, and the two theories are not necessarily bound up together.

The author gives much prominence to Chamberlin's arguments against Laplace's theory, and regards them as destroying the last support of the hypothesis of a molten interior, and as necessitating a fundamental revision of geological theories. Nevertheless, strong as are Chamberlin's arguments—based on considerations of angular momentum—they have not convinced so great an authority on cosmogony as Jeans that Laplace's nebular theory must be finally condemned, though Jeans has propounded a modified form of the theory to explain the origin of the solar system, which is of a very special type among celestial objects; in this theory the planets are supposed to have been separated from the sun, when the latter was much more diffused than now, by the passage of another star at a distance comparable with the sun's diameter at the time. This theory thus preserves the feature of Laplace's hypothesis which seems specially in disfavour with the author, viz. that the earth has cooled down from a diffuse gaseous state. The author himself advocates the planetesimal hypothesis, *i.e.* that the earth originated as a solid body by the aggregation of meteoritic material. However great the claims of this view may be regarded, our present knowledge, or rather ignorance, of the effect of pressure upon hot bodies certainly does not permit us to preclude the other view, that the interior of a large gaseous body might become solid under the influence of the pressure of the upper layers, before or at the same time as the formation of a solid crust.

Another outstanding omission to refer to recent work bearing on the subject relates to Wegener's theory of moving continental masses, now so much discussed by continental geologists. By many interesting diagrams the author shows the situation of the regions of present rapid change and great folding, and discusses Suess's theory that this folding is in general the result of overthrust of one land mass over another. Professor Hobbs's view is that mountains are raised as a result of underthrusts going out from areas of subsidence, generally the ocean areas. These thrusts are supposed due to shrinkage of the strata under the oceans, though no attempt is made to put the hypothesis on a quantitative basis. This, however, is perhaps scarcely feasible as yet, and Wegener's theory, which attributes the thrusts to the resistance of the heavier substrata to the motion of the land masses as wholes, has likewise many points of difficulty about it.

The author's theory of the origin of pockets of molten lava is one of the most interesting parts of the book. The rigidity of the earth is maintained under conditions of internal temperature which are sufficiently high, even relatively near the surface, for at least the aqueous fusion of rock. This rigidity is due to compression by the overlying load, which greatly raises the fusion point. It would therefore seem as if molten matter could exist only in places where the weight of the upper layers has been wholly or partly removed. This is supposed to occur by the folding of strong upper layers of rock into domed or arched forms, relieving the pressure beneath, at least for a time. This view differs widely from the one commonly held, viz. that the underground chambers of lava represent intrusions through the strata on which they rest, and that the pressure of the lava has itself elevated the roof of the chamber. The author ably supports his thesis by many different lines of evidence.

Textile Technology.

Textiles. By Prof. A. F. Barker. With chapters on The Mercerized and Artificial Fibres, and the Dyeing of Textile Materials, by W. M. Gardner; Silk Throwing and Spinning, by R. Snow; The Cotton Industry, by W. H. Cook; The Linen Industry, by F. Bradbury. (Westminster Series.) Revised edition. Pp. xii + 386. (London: Constable and Co., Ltd., 1922.) 15*s*.

OF the great trinity of human life's essential needs —food, shelter, and clothing—practically all the articles of clothing, as well as a considerable number of articles for improving the shelter, are derived from textiles. The provision of these and other articles has led to the development of the great textile industries. These industries together form the only serious rival to agriculture for chief place among the industries of the United Kingdom, while they rank supreme in their contribution to the country's exports, of which no less than some 40 per cent. are textiles.

It might be expected, therefore, that a large number of people would be interested either as producers or consumers in such a work as the present, which aims at giving in brief compass an outline of the textile industries in their historical, technical, industrial, and commercial aspects. The book opens with an historical introduction; there follow descriptions of the raw materials and their production, and of the principles and processes of spinning, weaving, designing, and finishing. Later chapters deal with the separate industries in turn, namely, the woollen, worsted, cotton, silk, linen, dress goods, etc., and the carpet industries. On the whole the purpose of the book is successfully achieved. The author rightly emphasises the fact that it is the article finally produced which determines the raw material employed and the processes through which this passes. It is for this reason that he deals first with the general principles of spinning and then with the various preparatory processes, which were developed later chronologically for the purpose of presenting the raw material to the spinning machines in a convenient form. The chapter on spinning, in which are described the modern machines and their relation to the old methods, is the best chapter in the book; the account of the preparatory processes is somewhat scanty, rather disjointed, and occasionally inaccurate. Improvements might be made in certain other directions. Thus, the descriptions of machines sometimes suffer from the absence of explanation of some of the technical terms used; while the replacement of a number of the illustrative photographs by line drawings would add considerably to the value of the book.

It is to be regretted that there is no uniformity of plan in dealing with the separate industries; each special contributor writes from his own particular point of view, with the result that a recasting of their work would be necessary to preserve the unity of the whole. None of these special chapters compares favourably with Prof. Barker's own contributions in general treatment and the selection of material; and in too many instances the statistics and other information, having remained unchanged from the 1910 edition, are now so out-of-date as to be misleading.

In spite of its deficiencies, however, this work remains probably the best in English affording a general introduction to the study of textile technology, and as such it is to be commended.

Highway Engineering.

Les Chaussées modernes. Par Prof. P. Le Gavrian. (Encyclopédie du Génie Civil et des Travaux Publics.) Pp. 431. (Paris: J.-B. Baillière et Fils, 1922.) 40 francs.

THE publication of this text-book marks another step forward in the evolution of one of the most recent developments of engineering and is therefore to be welcomed. Road engineering in its modern form may be said to be contemporaneous with the motor car, the advent of which has again brought a large portion of the national transport on to the roads after an eclipse which lasted from the decline of the stage coach, or even the Roman period, until the introduction of the internal-combustion engine for road vehicles.

The problem of constructing roads to suit modern traffic has probably been best met in Great Britain, but the task fell to busy men, the engineers to the local government authorities, who have had many other pressing and difficult problems to deal with during the same time. Consequently, the practice which has been developed, although well described in the periodical literature, has not been codified or reduced to the form of text-books, although two small publications by Mr. H. P. Boulnois and Mr. F. Wood have to a certain extent met the want.

France has, however, already established a Chair of Highway Engineering, the first occupant of which is